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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/408,703    09/30/99    HORNG

C    HT99-009

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WM02/0105

EXAMINER

WATKO, J

ART UNIT

PAPER NUMBER

2652

DATE MAILED:

01/05/01

3

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/408,703

Applicant(s)

HORNG ET AL.

Examiner

Julie Anne Watko

Art Unit

2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☒ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

## DETAILED ACTION

### *Oath/Declaration*

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c). A non-initialed and non-dated alteration appears on page 1, line 6 of the declaration.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gill et al (US Pat. No. 5701222) in view of Lee et al (US Pat. No. 6141191).

As recited in claim 6, Gill et al show a giant magnetoresistive (GMR) sensor element (see Fig. 3b).

As recited in claim 17, Gill et al show a spin valve magnetoresistive (SVMR) sensor element (see Fig. 3b).

As recited in claims 6 and 17, Gill et al show a substrate 50; a seed layer 61 formed over the substrate; a nickel oxide material layer 47 formed over the seed layer; a free ferromagnetic layer 39 formed over the nickel oxide material layer; a non-magnetic conductor spacer layer 41

formed over the free ferromagnetic layer; a pinned ferromagnetic layer 43 formed over the non-magnetic conductor spacer layer; and a pinning material layer 45 formed over the pinned ferromagnetic layer.

As recited in claims 6 and 17, Gill et al do not explicitly show the seed layer being formed of a magnetoresistive (MR) resistivity sensitivity enhancing material selected from the group consisting of nickel-chromium alloys and nickel-iron-chromium alloys.

As recited in claims 6 and 17, Lee et al show a seed layer being formed of a magnetoresistive (MR) resistivity sensitivity enhancing material selected from the group consisting of nickel-chromium alloys and nickel-iron-chromium alloys (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the seed layer of Gill et al of a magnetoresistive (MR) resistivity sensitivity enhancing material selected from the group consisting of nickel-chromium alloys and nickel-iron-chromium alloys as taught by Lee et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to select the seed layer of a magnetoresistive (MR) resistivity sensitivity enhancing material selected from the group consisting of nickel-chromium alloys and nickel-iron-chromium alloys in order to improve grain structure in the deposited layers enhancing the GMR coefficients and the thermal stability of the SVMR sensors.

As recited in claim 7, Gill et al show that the giant magnetoresistive (GMR) sensor element is selected from the group consisting of simple spin valve magnetoresistive (SVMR) sensor elements, synthetic antiferromagnetically biased giant magnetoresistive (GMR) sensor elements, simple spin filter giant magnetoresistive (GMR) sensor elements and spin filter synthetic antiferromagnetically biased giant magnetoresistive (GMR) sensor elements.

As recited in claims 8 and 18, Gill et al show that the nickel oxide material layer is formed as a non-magnetic dielectric nickel oxide material layer (see col. 6, lines 19-22; see also col. 6, lines 55-59).

As recited in claims 8 and 18, Gill et al do not explicitly show that the nickel oxide material layer is formed to a thickness of from about 5 to about 15 angstroms.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the nickel oxide material layer of Gill et al to a thickness of from about 5 to about 15 angstroms as a non-magnetic dielectric nickel oxide material layer. The rationale is as follows: one of ordinary skill in the art would have been motivated to arrive at the claimed dimensions through the process of routine experimentation and optimization in the absence of criticality Gardner v. TEC systems, Inc., 220 USPQ 777 (Fed. Cir. 1984) in order to enhance exchange coupling between a ferromagnetic layer and a NiO layer.

As recited in claims 9 and 19, Gill et al show that the free ferromagnetic material layer and the pinned ferromagnetic material layer are each formed of a ferromagnetic material selected from the group consisting of nickel, iron and cobalt ferromagnetic materials, alloys thereof, laminates thereof and laminates of alloys thereof (see col. 5, lines 60-65). As recited in claims 10 and 20, Gill et al show a magnetoresistive (MR) head 21 having incorporated therein a sensor element. As recited in claims 11 and 21, Gill et al show that the magnetoresistive (MR) head is selected from the group consisting of magnetoresistive (MR) read only magnetic heads, merged inductive write magnetoresistive (MR) read magnetic heads and non-merged inductive write magnetoresistive (MR) read magnetic heads. As recited in claims 12 and 22, Gill et al show a

magnetic data storage enclosure (see Fig. 1) having incorporated therein a magnetoresistive (MR) head.

The methods of claims 1-5 and 13-16 would have been obvious over the apparatus of claims 6-12 and 17-22.

*Conclusion*

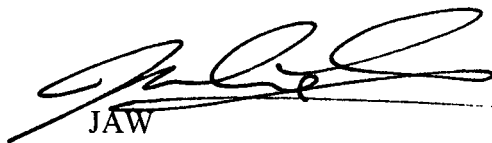
4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Aoshima et al (US Pat. No. 6046894) show an MR head comprising an NiFeCr seed layer 22.

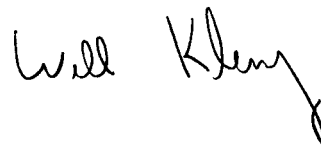
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Anne Watko whose telephone number is (703) 305-7742.

The examiner can normally be reached on Mon-Thurs 10:30-8 and alternate Fri 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-9051 for regular communications and (703) 305-7201 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

  
JAW  
December 28, 2000

  
WILLIAM KLIMOWICZ  
PRIMARY EXAMINER